

**BUREAU OF ENVIRONMENTAL REMEDIATION/REMEDIAL SECTION
GUIDELINE**

**SCOPE OF WORK FOR A
REMEDIAL DESIGN (RD)/REMEDIAL ACTION (RA)**

BER POLICY#BER-RS-026

DATE: 1991

Revised 1996

Revised 2001

Revised 2005

PAGES: 6

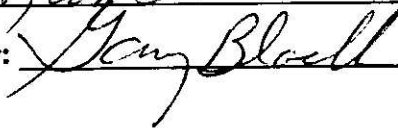
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All work completed under a Remedial Design/Remedial Action (RD/RA) SOW shall be consistent with § 300.435 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR 300 (final rule promulgated 3/8/90), as provided by relevant portions of §§ 101-121 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. All work performed pursuant to an RD/RA Consent Agreement shall also follow all pertinent EPA and KDHE RD/RA guidance. The RD/RA SOW identifies the general activities that Respondent(s) are required to perform to complete a RD/RA. All work performed pursuant to a RD/RA SOW shall follow the implementation schedule and all procedures approved in the Final RD/RA Work Plan or as amended thereto.

The RD/RA phase of work includes the design of the remedy selected in the final decision document (e.g., Corrective Action Decision (CAD) or Record of Decision (ROD)) for the site or operable unit and implementation of the remedy, including construction and an initial period of operation and maintenance following start-up of the remedial system, as appropriate. Pre-design data acquisition may be necessary to obtain pertinent data (aquifer pump tests, pilot tests, treatability studies, etc.) to facilitate the RD.

REMEDIAL DESIGN (RD)

OBJECTIVES:

The primary objectives of the **Remedial Design (RD)** are described as follows:

- 1) To evaluate and interpret data generated in the planning phase, such as treatability/performance data, and geotechnical data.
- 2) To collect and evaluate additional data required for the design phase (pre-design data acquisition phase). The need for this additional data shall be determined by the KDHE Project Manager based on site-specific information.
- 3) To provide a complete engineered design of the remedial system to be implemented (i.e., plans and specifications) as described in the final decision document.
- 4) To provide a contingency plan that identifies an alternate corrective action to be implemented in the event the selected remedy fails or is otherwise unable to achieve the remedial action objectives (RAOs) within a reasonable timeframe as determined by

KDHE. The contingency plan may also describe actions to be taken in the event of an accident or emergency.

- 5) To identify and obtain easements, permits and approvals that will be required to implement the selected remedy.
- 6) To identify critical technical requirements and activities where quality may be at risk and to design a construction quality control program and a testing program to demonstrate that the proposed methods, materials and equipment are acceptable.
- 7) To create a Site Monitoring and Performance Evaluation (SMPE) Plan to evaluate the effectiveness of the implemented remedy in attaining the remedial action objectives (RAOs), performance objectives and specified cleanup levels for all exposure pathways of concern.

RD IMPLEMENTATION:

Respondent(s) shall submit the RD Work Plan or detailed implementation schedule to KDHE within the time period specified in the RD/RA Consent Agreement. The Respondent(s) shall submit all plans, submittals and other deliverables required under the approved RD Work Plan or implementation schedule in accordance with the approved schedule.

RD PHASE DELIVERABLES:

The following components shall, at a minimum, be submitted during the Remedial Design Phase. These components may be submitted separately or combined into one or more reports.

1. **RD Work Plan:**
The KDHE project manager will determine, based on site-specific criteria, whether a RD Work Plan will be required. If a pre-design data acquisition phase is necessary, a RD Work Plan will be required. The RD Work Plan shall describe in detail all tasks necessary to acquire additional data to support the development of a Final Remedial Design and to construct, implement, and monitor the performance of the selected remedy. All necessary tasks shall be documented and described in adequate detail to clearly state the manner in which they will be implemented and reported. The tasks shall include those necessary for implementing institutional controls and obtaining the appropriate easements, permits, etc.
2. **Implementation Schedule:**
A detailed implementation schedule must be provided which defines dates for submittal or implementation of certain remedial design and pre-design milestones, including, but not limited to: (1) a pre-design data sampling and analysis work plan and report, if required (including Field Sampling Plan, Quality Assurance Project Plan, and Health and Safety Plan); (2) treatability studies plan, if required; (3) a preliminary remedial design submittal; (4) an intermediate remedial design submittal (if necessary); (5) a pre-final/final remedial design submittal; (6) a Construction Quality Assurance Plan; (7) a Contingency Plan; (8) a Site Monitoring and Performance Evaluation Work Plan; (9) Site Monitoring and Performance Evaluation report(s); and (10) the Remedial Action (RA) Work Plan. It is suggested that the detailed implementation schedule be presented graphically in the form of a milestone chart (e.g., Gantt or Pert chart) or critical path diagram. As necessary, the detailed implementation schedule must be updated and submitted to KDHE as part of the routine reporting requirements.

3. Remedial Design Plan(s):
Complete design specifications and drawings/schematics, including any relevant figures and/or site system engineering layouts (e.g., process flow diagram (PFD), piping and instrumentation diagram (P&ID), etc.), shall be provided. Dependent upon the scale and complexity of the remedial action, as appropriate, preliminary, intermediate and/or pre-final/final design plans shall be submitted to KDHE for approval. The Preliminary Remedial Design Plan should present the conceptual design of the selected remedy and describe any additional data collection necessary to complete the design. The Intermediate Remedial Design Plan should integrate any newly collected data into a refined conceptual design. The Pre-Final/Final Remedial Design Plan should provide specifications in sufficient detail so that contractors may bid (unit basis) on the construction, implementation, and operation of the remedial system(s), and should include a detailed schedule for construction and field implementation of the selected remedy.
4. Construction Quality Assurance Plan (CQAP):
The purpose of the CQAP is to ensure, with a reasonable degree of certainty, that a completed remedial action meets or exceeds all design criteria, plans and specifications. The CQAP should describe the quality control program and testing plan proposed to demonstrate that the materials and equipment are acceptable for their designated use and installed to the required specifications. The CQAP should clearly designate the entity or entities responsible for implementing and overseeing the quality control program. The CQAP should provide a general description of inspection/testing activities with identification of specific sampling types, locations, size, frequency of testing, acceptance and rejection criteria, and plans for implementing corrective measures. Documentation requirements and a proposed submittal schedule should be included in the CQAP.
5. Contingency Plan:
The Contingency Plan shall discuss the criteria that will be used to determine if the implemented remedy is achieving the RAOs. It will discuss the modifications, augmentations or other contingencies that will be utilized or implemented if the designed remedy fails to meet the RAOs. If appropriate, the Contingency Plan may also describe actions to be taken in the event of an accident or emergency. If the contingent remedy represents a fundamental change from the original selected remedy, then community involvement and CAD/ROD Amendment may be necessary.
6. The Site Monitoring and Performance Evaluation Work Plan (SMPE Work Plan):
The SMPE Work Plan shall propose and describe the activities necessary to evaluate the effectiveness of the implemented remedy. This plan should address both short-term and long-term performance evaluation benchmarks and, at a minimum, shall include:
 - a description of the site-specific RAOs;
 - a description of the remedial system operations that will be evaluated and identification of the criteria that will be used to evaluate system performance;
 - frequency, methods, and rationale for site and remedial system monitoring;
 - a description of the environmental media to be monitored (ground water, surface water, soil, soil vapor, etc.);
 - a description of quality assurance/quality control (QA/QC) considerations for the laboratory and field activities;
 - identification of institutional controls that will be implemented and maintained;
 - a plan for evaluating changes in land use at the site that may affect the remedial action; and

- a description of reporting methods, format, and frequency.
7. Site Monitoring and Performance Evaluation Reports (SMPE Reports):
The SMPE Reports shall discuss the results of the monitoring as proposed in 6 above. At a minimum, the SMPE Report shall include, as appropriate:
- a narrative description and graphic illustration of the effectiveness of the corrective action;
 - a description of system operation and performance;
 - a description of repairs or modifications made to the corrective action system during the reporting period, as appropriate;
 - laboratory analytical data including copies of laboratory reports and summary tables;
 - contaminant isoconcentration maps;
 - a tabular comparison of the current monitoring data to previous monitoring results, including quantitation limits for non-detect results and other data qualifiers;
 - a figure illustrating the site and associated monitoring wells or other sample point locations;
 - static water table elevation measurements;
 - a potentiometric surface map;
 - a description of any deviations from approved sampling procedures;
 - QA/QC sample results and a data validation summary;
 - logs of any newly constructed site wells;
 - an evaluation of the effectiveness of institutional controls implemented for the corrective action;
 - an evaluation of land use of the impacted area;
 - specific conclusions and recommendations (for further action or change) based on historical site monitoring and performance data trends; and,
 - any other relevant site data collected during the reporting period.

COMMUNITY RELATIONS:

Prior to initiation of the RD, KDHE shall review the Community Relations Plan (CRP) to determine whether it should be revised to describe further public involvement activities during the RD/RA. At the completion of the RD, KDHE will generate a fact sheet describing the Final Remedial Design and provide, as appropriate, a public briefing prior to initiation of the Remedial Action.

REMEDIAL ACTION (RA)

OBJECTIVES:

The Remedial Action (RA) is the process by which the remedy selected in the final decision document and defined by the RD is implemented. The primary objectives of the **Remedial Action (RA)** are described as follows:

- 1) To construct the remedial system as approved by KDHE and presented in the Final RD, and to verify that the constructed remedy meets project requirements through submittal of a RA Report;
- 2) To generate a Final Operation and Maintenance (O&M) Plan in accordance with the “as-built” remedial system;

- 3) To operate and maintain the remedial system as described in the approved O&M Plan;
- 4) To monitor and evaluate the performance of the RA and report the results as described in the approved SMPE Work Plan;
- 5) To determine whether RAOs have been attained or are likely to be attained by the RA;
- 6) To confirm attainment of RAOs by conducting post-RA monitoring as approved in the SMPE Work Plan;
- 7) To implement the approved Contingency Plan as necessary if the implemented RA is unable to attain RAOs within a reasonable timeframe as determined by KDHE;
- 8) To submit a Final Close Out Report to KDHE briefly summarizing the implemented RA, and documenting that the site-specific RAOs have been attained; and
- 9) To submit a request to KDHE to reclassify the site to “Resolved” status on the KDHE/BER Identified Sites List.

RA WORK PLAN:

After the approval of the Final RD, Respondent(s) shall submit to KDHE, a RA Work Plan in accordance with the implementation schedule and as required in the RD/RA Consent Order. The RA Work Plan shall provide for construction of the remedy, as approved by KDHE in the Final Remedial Design Plan. Concurrent with the submittal of the RA Work Plan, Respondent(s) shall submit to KDHE a revised Health and Safety Plan for field activities required by the RA Work Plan which conforms to the applicable Occupational Safety and Health Administration (OSHA) and EPA requirements.

The RA Work Plan shall, at a minimum, include the following: (1) description of the selection method for the RA contractor(s); (2) the schedule for implementation of all RA tasks identified in the Final RD; (3) methodology for implementation of the CQAP; (4) procedures and plans for the decontamination of equipment and the disposal of any contaminated materials and investigation-derived wastes; and (5) a discussion of RA reporting requirements.

RA IMPLEMENTATION:

Upon approval of the RA Work Plan by KDHE, Respondent(s) shall initiate the tasks necessary to implement the RA activities according to the approved RA Work Plan and implementation schedule. The Respondent(s) shall submit all plans, reports, or other deliverables in accordance with the approved implementation schedule.

RA DELIVERABLES:

The Respondent(s) must submit an RA Report within 90 days of construction completion and initiation of remedial activities. The RA Report must certify that all items contained in the RD/RA work plans have been completed and present a system startup report and as-built drawings stamped by a professional engineer. The report should contain a narrative description

of any modifications to the approved Final RD and the reasons the modifications were necessary. The report should also contain the SMPE sampling and reporting schedule, a summary of the site specific RAOs, the estimated time to achieve the RAOs, and a general project summary.

An O&M Plan for the as-built remedial system must be submitted for KDHE approval. The O&M Plan should include a description of the method of operation of the constructed remedy and a description of all routine inspections or other maintenance necessary to insure proper operation of the remedial system.

The effectiveness of the RA shall be monitored as provided through implementation of the SMPE Work Plan. The frequency of the SMPE monitoring and reporting shall be in accordance with the approved SMPE Work Plan unless otherwise approved by KDHE in writing. If the SMPE reports indicate that the remedial system is not achieving the RAOs, it may be necessary to implement the approved Contingency Plan. KDHE should be notified at least seven days in advance of implementing any significant modifications to the approved RA.

ATTAINMENT OF RAOs

Upon determination by the Respondent(s) that the remedial system has attained site RAOs, a Final Close Out Report should be submitted to KDHE. The Report should, at a minimum, contain the following:

- A summary of site conditions;
- Demonstration of cleanup activity QA/QC;
- Data and evidence supporting the conclusion that RAOs have been achieved;
- Post-monitoring or five-year review information.

KDHE will review the evidence submitted and issue a letter confirming or refuting the claim that RAOs have been met. If KDHE concurs that the remedial action is complete, KDHE will prepare a Reclassification Report to reclassify the site to “Resolved” status on the KDHE/BER Identified Sites List.

KDHE strongly recommends that any persons performing RD/RA activities with State of Kansas oversight obtain and familiarize themselves with the following documents. These documents provide guidance on the preparation, implementation, and reporting of RD/RA activities, and constitute much of the technical basis on which KDHE reviews work plans, reports, and other submittals related to the RD/RA process. Information on obtaining the EPA documents is available on-line at <http://www.epa.gov/epahome/publications.htm>. Information on the State Cooperative Program administered by the Remedial Section of the Bureau of Environmental Remediation can be found on-line at the KDHE web site, http://www.kdheks.gov/remedial/state_remedial_unit.html.

EPA/600/R-98/018 February 1998; EPA Guidance for Quality Assurance Project Plans (EPA QA/G-5).

EPA 600/R-96/055 August 2000; Guidance for the Data Quality Objectives Process (EPA QA/G-4).

EPA 540/R-95/059 June 1995; Remedial Design/Remedial Action Handbook.